2003 MRS FALL MEETING

December 1-5 • Boston, MA

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MRS Symposium V: Critical Interfacial Issues in Thin-Film Optoelectronic and Energy Conversion Devices

There is an increasing emergence of heterostructure devices employing very diverse materials to obtain improved performance or unique functionality for a variety of optoelectronic and energy conversion applications. Many of these optoelectronic systems have their properties dominated by interfaces involving semiconductors, polymers, dyes, and electronic oxides. The symposia will focus on the critical nature of these interfaces with respect to light absorption, charge carrier separation, lifetime and transport, and device sensitivity and stability. A thrust will be to identify common themes, which could lead to improved performance. Interfacial issues are paramount because of the diverse materials and length scales employed (bulk heterostructures to nanoscale composites). Some examples are thin-film photovoltaic devices, such as the Gratzel cell, polymer photovoltaics, and photoelectrochemical cells and related electro-optical devices such as thick-film transistors, OLEDs, fuel cells, and sensors. The symposia will focus exclusively on the nature of these critical interfaces and how they influence device performance.

Overall focus will be on the emerging classes of devices with diverse heterostructures and/or composite structures on the nanoscale including:

- TFTs, OLEDs, sensors, micro-fuel cells, solid-state microbatteries, Gratzel cells, polymer and small molecule photovoltaic cells, and photoelectrochemical cells

Materials of interest include:

- Oxides, polymers/dyes, semiconductors

Forms include:

- Thick films, thin films, and composites combined so as to form self-organized or nanostructured interfaces

Growth issues will be included where the focus is the control/modification of interfacial properties. Some issues include:

- Amorphous vs crystalline films, atomically smooth vs rough surfaces, the importance of electron affinity, surface states, zeta potential, growth in high-energy environments (IBAD/ECR, etc), and low-temperature growth by sol-gel and other atmospheric processing approaches

Modeling will be investigated as it describes the nature of the interface and theoretical predictions as to the nature of controlling properties defining the interface properties.

Other areas of interest will be novel device structures and unique interfacial structures.

Joint sessions are anticipated with Symposia E: *Fundamentals of Novel Oxide/Semiconductor Interfaces*, J: *Interfaces in Organic and Molecular Electronics*, and S: *Thermoelectric Materials 2003—Research and Applications*.

A tutorial complementing this symposium is tentatively planned as part of this four-day symposium. Further information will be included in the program that will be available in September.

Invited speakers (tentative) include: **Neal Armstrong** (Univ. of Arizona), **Harry Atwater** (California Inst. of Technology), **Steven Forrest** (Princeton Univ.), **Rachel Goldman** (Univ. of Michigan), **Brian Gregg** (National Renewable Energy Lab), **John Lindsey** (North Carolina State Univ.), **Tobin Marks** (Northwestern Univ.), **Gerald Meyers** (Johns Hopkins Univ.), **Charles Tu** (Univ. of California-San Diego), **John Turner** (National Renewable Energy Lab), and **Jeff Yang** (USSC).

ABSTRACT DEADLINES:

June 5:
for abstracts sent
via fax or mail

June 19:
for abstracts sent
via the MRS Web site

For additional meeting information, visit the MRS Web site at

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The 2003 MRS Fall Meeting will serve as a key forum for discussion of interdisciplinary leading-edge materials research from around the world. Various meeting formats—oral, poster, round-table, forum and workshop sessions—are offered to maximize participation.